

DRAFT:

~~Coordination of dedicated run (?)~~

K. Kubo

- We will have one or more meetings every day during beam operation, but we need to decide (agree) many things in advance.
 - Goal
 - Strategy
 - Major tactics
 - Rules

- Decide now, if possible.
- Decide today, during/after following discussions, if possible.
- If not,
 - Assign person who provide necessary information for making decision.

Define Goal

E.g.

- Confirm beam size at IP, $< ##$ nm
 - Or, Make clear the reason why we cannot have small beam.

Can we decide now?

Make Strategy

- Optics choice
- How to proceed tuning.
 - Beam tuning vs. Monitor tuning
 - Upstream vs. Downstream
 - etc.

Example of Strategy

- Step 1: Establish condition for IPBSM174 deg mode
 - Make <2 um using carbon wire monitor.
 - Use IPBSM <-30 deg mode, tuning by linear knobs.
 - IPBSM174 deg mode. Observe clear modulation.
 - Make all angle modes of IPBSM ready.
 - If failed, investigate why, re-start from tuning of upstream, or IPBSM.
- Step 2: Further tuning for smaller size.
 - If failed, investigate why, start from tuning of upstream, or IPBSM. May go back to step 1.
 - Keep all angle modes of IPBSM ready.

Make Rules

E.g.

- (from slide of G.W.)
 - Check EXT emittance, dispersion and IPBSM EVERY time previous minimum not reproduced
 - Only need 1 or maybe 2 iterations of a_y , $\eta \sim y$, $\langle x'y \rangle$ per IPBSM mode down to $\sim 100\text{nm}$
 - If not, something is wrong. Stop and rethink.
- Change angle modes of IPBSM if xxxxxxxx
- (Consider to ?) Adjust RF frequency if $\text{Abs}(DE/E) > ###$.

Make Rules 2

- Any rules we can (and should) decide now?
- Any rules we should have?

Optics choice

- 10x1.
- Optimized including multi-poles? Or same as last operation?
- Any possibility to change optics during operation?
- Need decks of SAD and Lucretia. (?)

Define knobs to be used

- Which knob in what condition?
 - E.g.: Only 3 linear knobs for IPBSM ≤ 30 deg mode?
- Which non-linear knobs?
- Use skew sextupole or not?

Choice of angle mode of IPBSM

E.g.

- Do not care absolute beam size from different modes? Look at relative change in each mode?
- Go to larger angle mode after 1 or 2 sets of linear knob scans, if results are stable and consistent.

Specify tolerable upstream beam conditions, IPBSM conditions,,,

- In what condition DR should be re-tuned?
- In what condition EXT/FF should be re-tuned?
- In what condition IPBSM should be re-tuned?

Keep monitors (in addition to IPBSM) reliable

Specifications?

How to check?

- M-OTR
- BPM

Horizontal emittance

- How much time should we spend for investigation?
- Do we have any theory which might explain the problem?
- Possible check in beam operation
 - Check M-OTR system
 - Compare with wire scanners
 - Measure in DR (LW, SR interferometer at small η_x)
 - Look dependence on EXT orbit?

Orbit feedback

- Use EXT/FF feedback as in last operation
 - Specify BPM performance.
- Should DR COD feedback be used?

EXT/FF set up and tuning

Do we have agreed procedure? Procedure in last operation was: (From slide of G.W.)

- Steering, EXT dispersion, coupling
- Turn off FFS sextupoles
- IP beam on waists with QD0/QF1
- Reduce IP vertical dispersion $< 0.1\text{mm}$ with QD0 tilt
- Minimise coupling by reduction IP σ_y with roll optimisation of strongest FFS matching quads (QM14=600urad, QM12=300urad)
- Switch on SD0FF
 - Recover 0 dispersion situation with vertical mover
 - Recover waist situation with horizontal mover and QD0 waist scans
- Other sextupoles: previously calculated BPM BBA offset values

Optics matching at IP

Before multi-knob scan

- What should be adjusted? in what accuracy?
- In EXT too? Or only at IP?
- Method ?
 - Change QM##FF strength?

Possible Issue

- Make tuning quick for avoiding drift effects, OR, be careful with detailed consistency check?
- Difficult to decide before actual operation?

Modification (Improvement) of IPBSM

- We agree on proposed improvement.

To be prepared in summer

- For monitoring MB1X and MB2X
- H-beam size monitor at SR2 location (small η_x)
- DR LW ?
-
-
-
-
-

Anything else?